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December 18, 2007

Mail Stop Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Re: U.S. Patent No.: 7,244,086 B2

Issued: July 17, 2007

Title: "APPARATUS FOR VACUUM TREATING TWO DIMENSIONALLY
EXTENDED SUBSTRATES AND METHOD FOR MANUFACTURING SUCH
SUBSTRATES"

Inventors: Rainer Ostermann et al.

Our Docket No.: 35156US1

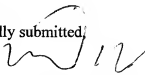
Sir/Madam:

A Certificate of Correction under 35 U.S.C. 254 is hereby requested to correct an error in the above-identified patent. Enclosed herewith is a proposed Certificate of Correction (Form No. PTO-1050) for consideration, along with the appropriate documentation supporting the request for correction.

It is requested that the Certificate of Correction be completed and mailed at an early date to the undersigned attorney of record. The proposed correction is an obvious one and does not in any way change the sense of the application.

We understand that a check is not required since the errors were on the part of the Patent and Trademark Office in printing the patent.

Respectfully submitted,



By Michael W. Garvey, Reg. No. 35878

MWG/jmm

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 1 of 1

PATENT NO. : 7,244,086 B2

APPLICATION NO.: 10713,339

ISSUE DATE : July 17, 2007

INVENTOR(S) : Herbert Bächler et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the cover page:

Please add the following heading and description: --Related U.S. Application Data--

--This application claims priority of U.S. Provisional Application Serial No.: 60/426,697--

Column 5, line 17: Please delete "1A" and insert therefor --1 A--.

Column 11, line 59: Please delete "9a,9b" and insert therefor --9a, 9b--.

Column 11, line 61: Please delete "9a,9b" and insert therefor --9a, 9b--.

Column 11, line 63: Please delete "1a,1b" and insert therefor --1a, 1b--.

Column 12, line 62: Please delete "BL₁₀" and insert therefor --BLL₁₀--.

Column 14, line 53: Please delete "1 m₂" and insert therefor --1 m²--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

APPLICATION DATA SHEET

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Title of Invention: APPARATUS FOR VACUUM TREATING TWO
DIMENSIONALLY EXTENDED SUBSTRATES AND
METHOD FOR MANUFACTURING SUCH SUBSTRATES

Attorney Docket Number: 35156US1

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Continuity Data: This application claims priority of U.S. Provisional Application
Serial No.: 60/426,697, filed November 15, 2002.

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one of solar panel substrates, of TFT display panel substrates and of plasma display panels.

The present invention will now be described more in detail with the help of figures which show examples of preferred
5 embodiments of the present invention.

The figures show:

col 5 Fig. 1 A schematic side view of a loadlock- and
 processing tower as an essential component of the
 present invention thereby additionally showing
10 different operating modes of opening control at
 such tower.

Fig. 2 Still, in a schematic representation according to
 Fig. 1, a first preferred embodiment of a
 loadlock- and processing tower.

15 Fig. 3 In a still schematic representation in analogy to
 that of the Figs. 1 or 2, a still further
 preferred mode of a loadlock- and processing
 tower.

Fig. 4 In analogy to the representations of Figs. 1 to 3,
20 a third preferred variant of a loadlock and
 processing tower.

Fig. 5 Still in a representation in analogy to that of
 the Figs. 1 to 4, a fourth preferred embodiment of
 a loadlock- and processing tower.

25 Fig. 6 Still in a representation in analogy to that of
 the Figs. 1 to 5, a fifth preferred variant of a
 loadlock- and processing tower.

1a and LLPT 1b, as well as provision of a common treatment module for both LLPT 1a and 1b is not excluded. By the embodiment of Fig. 16 handling of substrates between LLPT 1a and LLPT 1b and serving a common treatment module without rotation of the substrates around the vertical axis in the transport arrangement.

Nevertheless, such rotation free crosswise handling may also be realised by a robot different than shown in Fig. 16.

The apparatus according to the present invention in its most preferred embodiments as of Figs. 10 and 12 does not necessitate any rotational movement about the vertical axis of a robot handling the substrates. The embodiment as of Fig. 12 may be called I-type due to its I-shaped footprint.

In the Figs. 17, 18, and 19 further preferred embodiments of the apparatus according to the present invention are schematically shown representations in analogy to that of Fig. 13. These embodiments do also not necessitate any rotational movement of a robot within the transport arrangement TA, about a vertical axis, so as to serve the openings of the LLPT's.

According to Fig. 17 to 19, instead of construing the apparatus in an I-type configuration as of Figs. 12 and 13 it is designed as a U-type apparatus. According to Fig. 17, the two LLPT's 1a and 1b are provided in a side by side position. In the vacuum chamber of the transport arrangement TA two robots 9a and 9b are installed, each serving the modules of one of the LLPT 1a, 1b via the respective openings. Each of the robots 9a, 9b provides for

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a vertical up and down movement v_a, v_b in a controllably driven manner. Each of the robots 9a, 9b further provides for horizontal forth and back movement h_a and h_b towards and into or from the modules of the respective LLPT 1a, 1b.

- 5 The robots 9a and 9b may e.g. be principally conceived according to the robot shown in Fig. 14 with support members 15_a and 15_b not pointing from each other but being provided on one side of support 13 and in parallelism. The movements of the two robots 9a and 9b may be independently controlled preferably by means of a freely reprogrammable control unit (not shown). If a time-synchronous processing shall be established at the two LLPT 1a, 1b, either the two independently controllable robots 9a and 9b are synchronously operated, or there is provided a single robot which serves simultaneously both LLPT 1a, 1b.

Such an embodiment is shown in Fig. 18 again schematically and in a representation in analogy to that of Fig. 17. As clearly be seen, there is provided one single robot 9ab which provides combined common vertical transport movement v_{ab} of substrates into alignment with openings at the LLPT 1a and 1b. The horizontal movements h_a, h_b are either synchronised, or are controlled specifically for each LLPTM.

- A third embodiment of U-shaped concept is shown in Fig. 19. Here again only one single robot 9ab is provided. The one robot 9ab serves by vertical transport movement v_{ab} and horizontal transport movement h_{ab} both LLPT's 1a and 1b. To do so the robot 9ab performs a horizontal movement w_{ab} as shown.

In Fig. 23 there is shown a today's preferred apparatus according to the present invention. It is conceived according to the concept of Fig. 10. Such preferred embodiment comprises one single LLPT which consists, from top to bottom, of a two-substrate batch processing module BPM_1 followed by a two-substrate batch input and output load lock module BLL_{i0} , followed by a second two-substrate batch processing module BPM_2 . Thereby, the loadlock module BLL_{i0} is subdivided into a first input loadlock compartment C_1 , followed by a first output loadlock compartment C_0 , followed by a second input loadlock compartment C_1 and finally a second output loadlock compartment C_0 . The respective openings 33 which establish communication between BPM_1 , BLL_{i0} , BPM_2 and a transport arrangement TA, are provided with respectively controlled valves 35.

Within the transport arrangement TA-chamber 37 there is provided a robot 39 which is drivingly moveable in a controlled manner in horizontal direction h and comprises a two-substrate batch transport member 41 with an upper and with a lower substrate transport fork 43_u and 43_l . The overall arrangement of the two horizontal transport members 41 is drivingly moveable vertically in a controlled manner. The pitch between the upper substrate carrier fork 43_u and a lower substrate carrier fork 43_l is selected to be in agreement with the pitch between the openings at each of the batch processing modules and the batch loadlock module.

Such an apparatus is most suited to be used for processing large substrates of at least $1m^2$, preferably of at least $2m^2$, even of at least $4m^2$ as for solar panel, TFT or plasma

Amendments to the Claims

This Listing of Claims replaces all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claims 1-6: (canceled)

¹ 1. (currently amended) The ~~apparatus of claim 1~~ ⁴ method of claim 23, wherein said transport robot comprises at least one horizontal substrate support for at least one substrate which support is driven exclusively in vertical and in horizontal direction, in a respectively controlled manner.

Claims 8-14: (canceled)

¹ 15. (currently amended) The ~~apparatus of claim 1~~ ¹ method of claim 20, wherein said first and said second loadlock and processing towers are arranged on opposite sides of said ~~transport common~~ vacuum chamber and facing each other.

¹ 16. (currently amended) The ~~apparatus of claim 1~~ ¹ method of claim 20, wherein said first and said second loadlock and processing towers are arranged one next to the other on one side of said ~~vacuum-common~~ transport chamber, said towers and said vacuum transport chamber thereby defining a U-shaped footprint.

¹ 17. (currently amended) The ~~apparatus of claim 1~~ ¹ method of claim 20, wherein said first and said second loadlock and processing towers are arranged with respect to said common vacuum transport chamber to define a Y-shaped footprint.

18. (currently amended) The ~~apparatus of claim 1~~ ¹ method of claim 20, wherein said first and second horizontal substrates has each have an extent of at least 1m². ² col. 14